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DESIGN CHANGE ON THE TWO STONE DRESSING TOOL USED IN DRESSING THE GRINDING WHEEL ON A CONTOUR CENTERLESS GRINDER

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ABSTRACT

A new design for a two-stone dressing tool for the grinding wheel of contour centerless grinder is presented which results in a 66 percent increase in the life of the tool at a cost increase of 19 percent.

I. INTRODUCTION

This report presents a design change in a two-stone dressing tool used in dressing the grinding wheel on a contour centerless grinder. The present tool has two small diamonds, sharpened to the proper chisel shape, set in a nib at a 15° angle to the 7/16 inch diameter shank that fits into the well on the grinder truing attachment (see Figure 1). Since the well in the truing attachment is at a 15° angle, it was thought that the faces of the two diamonds would then be tangent to the grinding wheel. This is true only when the diamonds protrude 15/64 inch from the truing attachment. The tools presently being used are not designed so that this can be done. A design is presented in this report which meets the specified requirements (see Figure 2).

II. METHODS AND DATA

If the center line of the truing attachment is extended, it becomes a radius of the grinding wheel. Therefore, if the diamonds of the two-stone dressing tool are positioned on each side of this center line, the plane in which the stones are positioned will always be tangent to the grinding wheel. The center line of the tool well intersects the end of truing attachment 1/16 inch below the center line of the truing attachment. The two center lines form a 15° angle and intersect 15/64 inch from the truing attachment (see Figure 3).

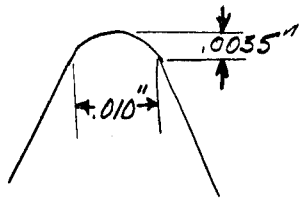
A new tool was designed with a 1/4 inch shoulder set at a 15° angle to the 7/16 inch shank (see Figure 2). This tool was tested under production conditions.

Testing Procedure

A No. 2 Centerless grinder was used for the test. It was equipped with a 2A-180-M6-VN grinding wheel, a standard work-rest blade, and Texaco Sol C mixed ten parts water to one part oil for coolant. The depth of cut for each pass was .0005 inch.

Nine tests were made using the regular production tool with a shoulder varying from 1/8 inch to 3/8 inch. The thickness of the shoulder was varied to determine the effect of this change on the life of the tool. This variation was accomplished by machining away part of the shoulder in four tests, using the tool as fabricated in two tests and adding a 1/8 inch shim in one test.

A number of tools which had been used in production and had been sent to the tool room for re-lapping were examined. It was found that when the nose of the diamonds was worn to the degree shown in the figure below, the tool was re-lapped. This amount of wear was used as an end point for determining the tool life in this test.



DATA

Test Number	Number of Passes Before Re-lapping Needed	Diamond Tool	Shoulder Thickness
1	30	Production	None
2	30	Production	None
3	35	Experimental	None
4	35	Experimental	None
5	35	Experimental	1/8"
6	35	Experimental	1/8"
7	50	Experimental	1/4"
8	50	Experimental	1/4"
9	25	Experimental	3/8"

III. SUMMARY AND RESULTS

It was found that the life of the new tool was approximately 50 passes and that the production tool had a life of approximately 30 passes. This is an increase in tool life of 66 percent.

The cost of the new tool was approximately $18.50 per tool on a purchase order of 12 tools. The cost of the production tool was approximately $15.50 per tool on a purchase order of 100 tools. Disregarding any quantity discount, the increase in cost of the new tool is 19 percent.

The data show that there was a decided decrease in tool life when the shoulder thickness was either less than or greater than 1/4 inch.

This is primarily a report of a design change and, therefore, the tool presented is not necessarily the only tool which can make use of this design change. One recommendation is to use a Wheel Truing Tool Company stock tool.

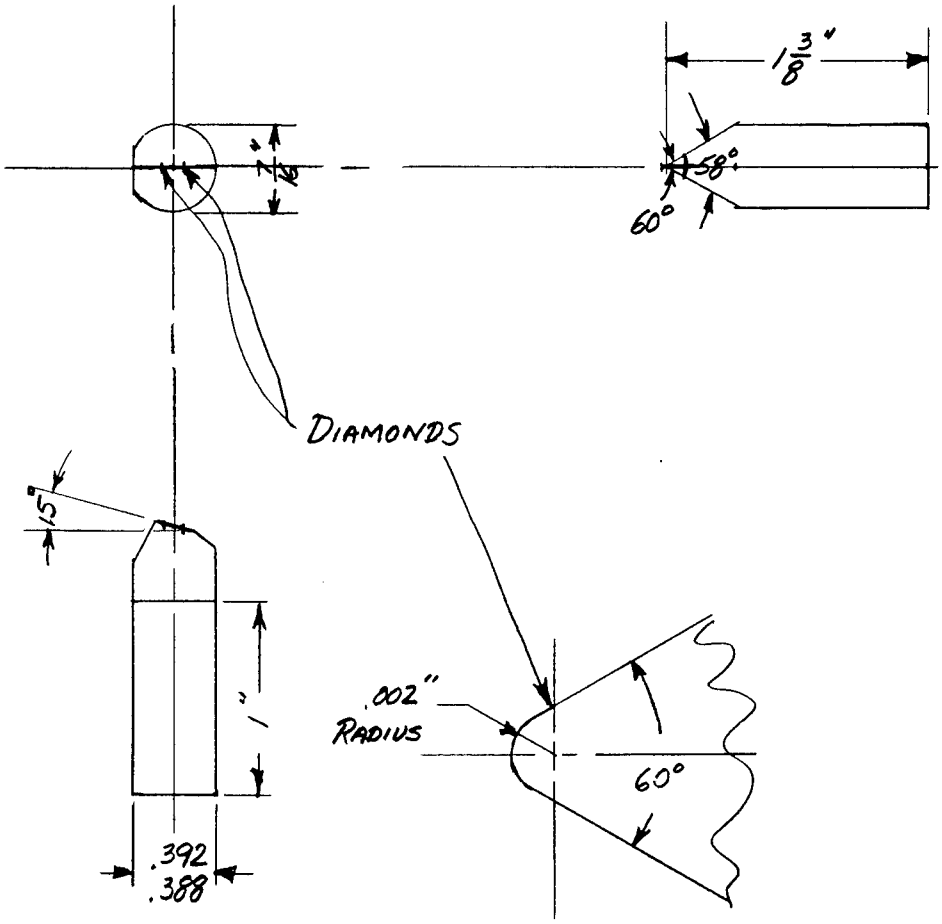


Fig. 1
PRESENT PRODUCTION TOOL

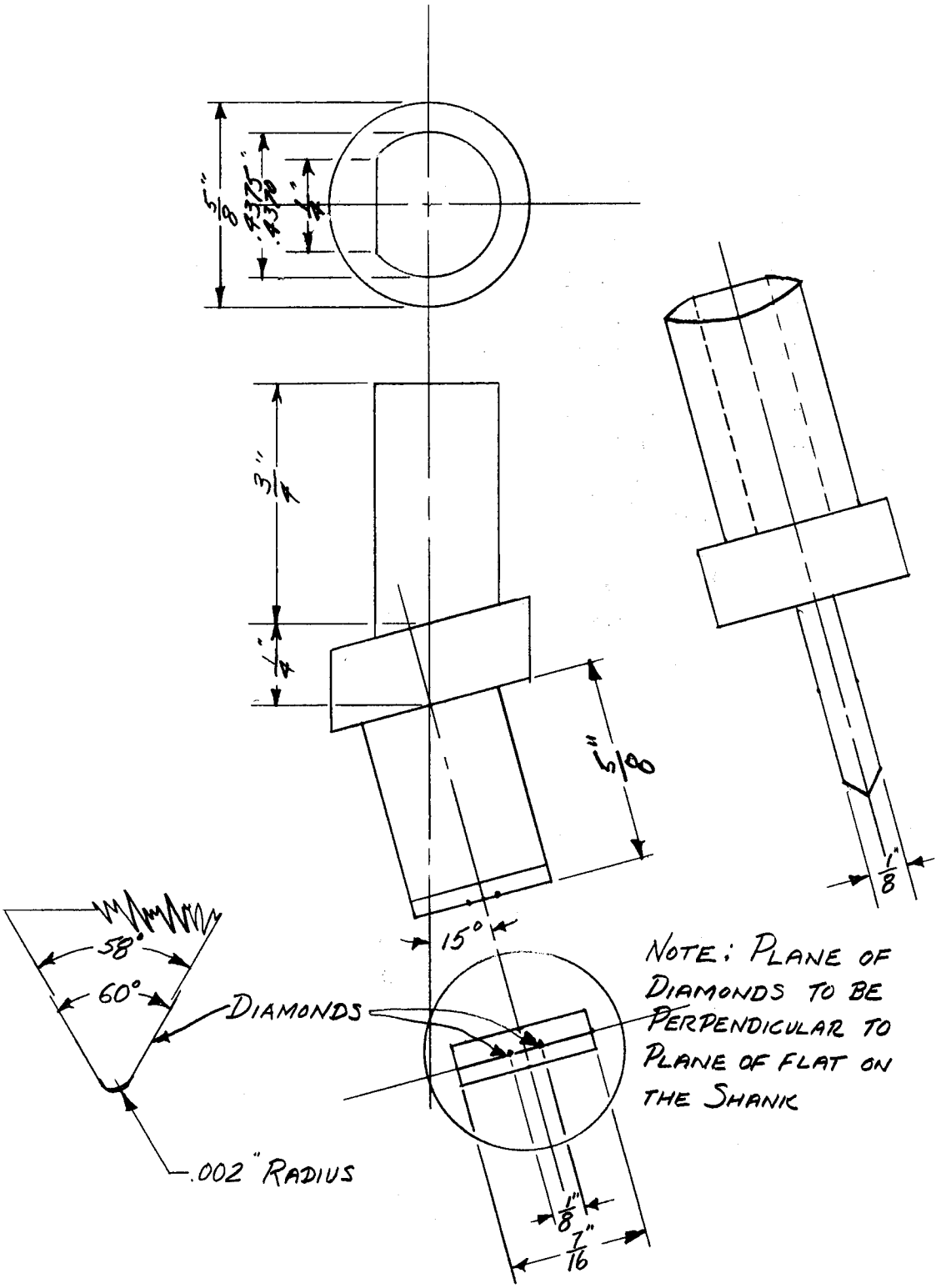


Fig. 2
NEW DRESSING TOOL

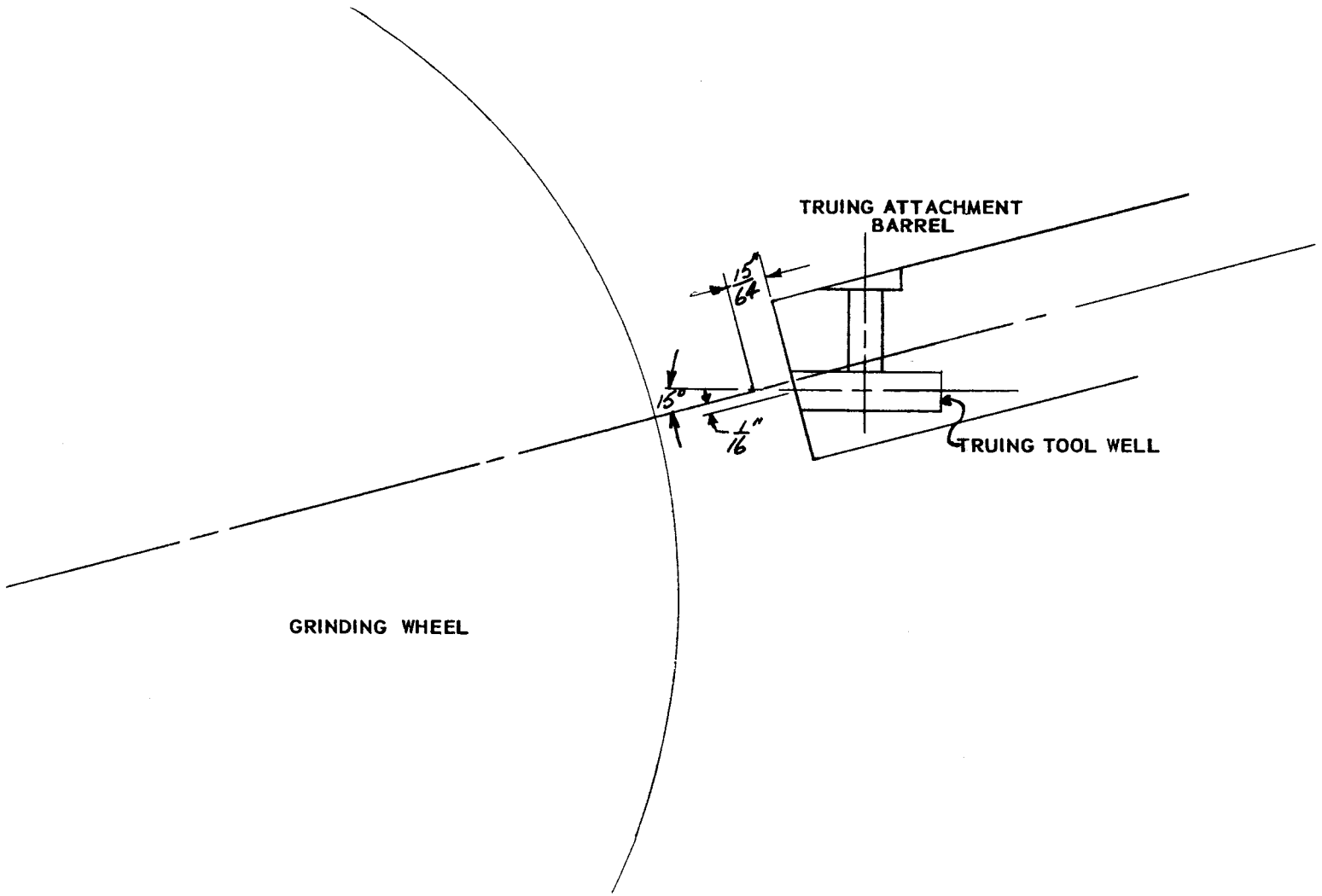


Fig. 3

PRINCIPAL COMPONENTS INVOLVED IN TRUING A GRINDING WHEEL ON A CENTERLESS GRINDER WITH A TWO STONE DRESSING TOOL